

Application No. 10/632,268

AMENDMENT AND RESPONSE AFTER FINAL dated November 11, 2005

Reply to Office Action of September 20, 2005

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Previously presented) An irrigation sprinkler nozzle, comprising:
 - a nozzle body defining a nozzle passage having an upstream end for mounting in flow communication with a supply of water under pressure, and a downstream end defining a nozzle outlet for outward projection of a water stream to irrigate surrounding terrain, said nozzle outlet being shaped to form at least a lower portion of said stream with a generally vertically oriented fan-like fan-shaped spray pattern;
 - said nozzle outlet including a lower margin, and having an outboard side defining a front face; and
 - a plurality of discrete ramps formed at said lower margin of said nozzle outlet and extending forwardly and angularly downwardly therefrom each of said ramps having a selected declination angle, each of said ramps having an upstream end disposed at least a distance upstream relative to said front face of said nozzle outlet, whereby a portion of the water passing through said nozzle outlet is forced and guided downwardly generally along said ramps to irrigate surrounding terrain relatively close to the sprinkler nozzle.
2. (Original) The irrigation sprinkler nozzle of claim 1 wherein said ramps each have a selected different declination angle.

3. (Original) The irrigation sprinkler nozzle of claim 1 wherein said ramps are arranged in a side-by-side array along said lower margin of said nozzle outlet, and further wherein each one of said ramps has a declination angle different from [[each]] the declination angle of each ramp adjacent thereto.

4. (Original) The irrigation sprinkler nozzle of claim 1 wherein each of said ramps has a selected width and a selected different declination angle.

5. (Original) The irrigation sprinkler nozzle of claim 1 wherein said plurality of ramps comprises at least three of said ramps.

6. (Original) The irrigation sprinkler nozzle of claim 1 wherein said ramps are arranged in a side-by-side array spanning substantially the entire width of said lower margin of said nozzle outlet.

7. (Original) The irrigation sprinkler nozzle of claim 1 wherein said nozzle outlet is further shaped to form at least an upper portion of said stream with a substantially collimated spray pattern.

8. (Previously presented) The irrigation sprinkler nozzle of claim 1 wherein said nozzle outlet further includes means formed generally at an upstream side thereof for laterally converging water flowing through said nozzle outlet to produce said generally vertically oriented fan-shaped spray pattern.

9. (Previously presented) The irrigation sprinkler nozzle of claim 8 wherein each of said ramps has an upstream end disposed at least a distance downstream relative to initial convergence of water by said converging means.

10. (Previously presented) The irrigation sprinkler nozzle of claim 1 wherein said nozzle outlet further includes laterally converging tapered transition surfaces formed generally at an upstream side thereof, and at opposite sides of said nozzle outlet, for laterally converging water flowing through said nozzle outlet to produce said generally vertically oriented fan-shaped spray pattern.

11. (Previously presented) The irrigation sprinkler nozzle of claim 10 wherein each of said ramps has an upstream end disposed at least a distance downstream from an upstream end of said laterally converging tapered transition surfaces.

12. (Original) The irrigation sprinkler nozzle of claim 1 wherein said nozzle outlet has a generally tombstone-shaped configuration defining an arched upper margin joined to a pair of generally straight side margins, said side margins being joined in turn to said lower margin which is also generally straight.

13. (Previously presented) The irrigation sprinkler nozzle of claim 12 wherein said side margins further include laterally converging tapered transition surfaces formed generally at an upstream side thereof, and at opposite sides of said nozzle outlet to extend over a lower region thereof, for laterally converging water flowing through said nozzle outlet to produce said generally vertically oriented fan-shaped spray pattern, each of said ramps having an upstream end disposed at

least a distance downstream from an upstream end of said laterally converging tapered transition surfaces.

14. (Original) The irrigation sprinkler nozzle of claim 1 further including a faceplate generally at said downstream end of said nozzle passage, said faceplate having said nozzle outlet formed therein.

15. (Previously presented) An irrigation sprinkler nozzle, comprising:
a nozzle body defining a nozzle passage having an upstream end for mounting in flow communication with a supply of water under pressure, and a downstream end defining a nozzle outlet for outward projection of a water stream to irrigate surrounding terrain, said nozzle outlet being shaped generally at an inboard side thereof for laterally converging water flowing through said nozzle outlet to form at least a lower portion of said stream with a generally vertically oriented fan-shaped spray pattern;

said nozzle outlet including a lower margin, and having an outboard side defining a front face; and

a plurality of ramps formed at said lower margin of said nozzle outlet and extending forwardly and angularly downwardly therefrom each with a selected different declination angle, each of said ramps having an upstream end disposed at least a distance upstream relative to said front face of said nozzle outlet, and at least a distance downstream relative to initial lateral convergence of water flowing through said nozzle outlet, whereby a portion of the water passing through said nozzle outlet is forced and guided downwardly generally along said ramps to irrigate surrounding terrain relatively close to the sprinkler nozzle.

16. (Original) The irrigation sprinkler nozzle of claim 15 wherein said plurality of ramps comprises at least three of said ramps.

17. (Original) The irrigation sprinkler nozzle of claim 15 wherein said ramps are arranged in a side-by-side array spanning substantially the entire width of said lower margin of said nozzle outlet.

18. (Original) The irrigation sprinkler nozzle of claim 15 wherein said nozzle outlet is further shaped to form at least an upper portion of said stream with a substantially collimated spray pattern.

19. (Previously presented) The irrigation sprinkler nozzle of claim 15 wherein said nozzle outlet further includes laterally converging tapered transition surfaces formed generally at an upstream side thereof, and at opposite sides of said nozzle outlet, for laterally converging water flowing through said nozzle outlet to produce said generally vertically oriented fan-shaped spray pattern, each of said ramps having an upstream end disposed at least a distance downstream from an upstream end of said laterally converging tapered transition surfaces.

20. (Original) The irrigation sprinkler nozzle of claim 15 wherein said nozzle outlet has a generally tombstone-shaped configuration defining an arched upper margin joined to a pair of generally straight side margins, said side margins being joined in turn to said lower margin which is also generally straight.

21. (Previously presented) An irrigation sprinkler nozzle, comprising:
a nozzle body defining a nozzle passage having an upstream end for mounting in flow communication with a supply of water under pressure, and a downstream end defining a nozzle outlet for outward projection of a water stream to irrigate surrounding terrain;

said nozzle outlet further including laterally converging tapered transition surfaces formed generally at an upstream side thereof and at opposite sides of said nozzle outlet for laterally converging water flowing through said nozzle outlet to form at least a lower portion of said stream with a generally vertically oriented fan-shaped spray pattern;

said nozzle outlet including a lower margin, and having an outboard side defining a front face; and

a plurality of ramps formed at said lower margin of said nozzle outlet and extending forwardly and angularly downwardly therefrom each with a selected different declination angle, each of said ramps having an upstream end disposed at least a distance upstream relative to said front face of said nozzle outlet, and at least a distance downstream from an upstream end of said laterally converging tapered transition surfaces, whereby a portion of the water passing through said nozzle outlet is forced and guided downwardly generally along said ramps to irrigate surrounding terrain relatively close to the sprinkler nozzle.

22. (Original) The irrigation sprinkler nozzle of claim 21 wherein said plurality of ramps comprises at least three of said ramps.

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23. (Original) The irrigation sprinkler nozzle of claim 21 wherein said ramps are arranged in a side-by-side array spanning substantially the entire width of said lower margin of said nozzle outlet.

24. (Original) The irrigation sprinkler nozzle of claim 21 wherein said nozzle outlet is further shaped to form at least an upper portion of said stream with a substantially collimated spray pattern.

25. (Original) The irrigation sprinkler nozzle of claim 21 further including a faceplate generally at said downstream end of said nozzle passage, said faceplate having said nozzle outlet formed therein.

26. (Original) The irrigation sprinkler nozzle of claim 21 wherein said nozzle outlet has a generally tombstone-shaped configuration defining an arched upper margin joined to a pair of generally straight side margins, said side margins being joined in turn to said lower margin which is also generally straight.